

## ORIGINAL CLAIMS

What is claimed is:

1. A database reorganization system, comprising:  
data records containing data items containing primary keys;  
a primary block which stores data record in the order of a primary key  
  
overflow blocks linked to primary blocks;  
  
a current location table and a new location table containing in contiguous regions entries describing the addresses of primary blocks; and  
  
means for sequentially writing entries in the current location table to the new location table and, where an overflow blocks exists, delinking the overflow block, creating new entries corresponding to primary blocks and adding the new entries to the new location table.
2. A database reorganization system, comprising:  
data records containing data items containing primary keys;  
primary blocks storing data records in the order of their primary keys;  
  
a current location table containing in a contiguous region entries describing the addresses of primary blocks;  
  
a first means for creating, upon receipt of a database reorganization command, a new location table in addition to the current location table; and  
  
a second means for sequentially writing primary block entries in the current location table to the new location table and, when an overflow blocks linked to a primary block is detected, delinking the overflow block, adding new entries to the new location table and rendering these as new primary blocks.
3. A database reorganization system, comprising:  
data records containing data items containing primary keys;  
a primary block storing data record in the order of the primary keys;  
  
a current location table containing in a contiguous region entries describing the addresses of primary blocks; and  
  
means for shifting fore and aft records in primary blocks and eliminating fragmentation when the storage rate in primary blocks falls outside a

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range of specified values;

4. The database reorganization systems of claims 1 or 2, additionally comprising:

provision of reorganization pointers to each of the current location table and new location table and storage in each reorganization pointer of the entry through which reorganization has terminated.

5. The database reorganization systems of claims 1 and 2, additionally comprising:

comparative means for, when retrieving a record by primary key during reorganization, comparing the value of the target primary key with the value of the primary key of the record contained in the primary block and overflow blocks of the entry indicated by the reorganization pointer; and

retrieval means for using the current location table to retrieve the target record when the value of the target primary key is found by the comparative means to be greater than or equal to the value of the primary key of the record stored in the blocks indicated by the reorganization pointer and for using the new location table to retrieve the target record when it is found to be less than the value of that primary key.

6. A database reorganization system, comprising:

data records containing data items containing primary keys and alternate keys;

primary blocks storing data records in the order of their primary keys;

alternate-key entries comprising alternate keys and primary keys;

alternate-key blocks containing alternate-key entries;

alternate-key overflow blocks linked to alternate-key blocks;

current alternate-key location table and new alternate-key location table containing alternate-key location table entries in contiguous regions;

means for sequentially writing entries in current alternate-key location table to new alternate-key location table and, where an alternate-key overflow block exists, delinking the alternate-key overflow block, creating entries in the new alternate-key location table corresponding to alternate-key blocks and adding new alternate-key location table entries to new alternate-key location table.

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Art 19*

7. A database reorganization system, comprising:

data records containing data items containing primary keys and alternate keys;

primary blocks storing data records in the order of their primary keys;

alternate-key entries comprising alternate keys and primary keys;

alternate-key blocks containing alternate-key entries;

current alternate-key location table containing in contiguous regions alternate-key location table entries describing the addresses of alternate-key blocks;

a first means for creating, upon receipt of a database reorganization command, new alternate-key location table in addition to the current alternate-key location table; and

a second means for sequentially writing alternate-key block entries in current alternate-key location table to new alternate-key location table and, when an alternate-key overflow block linked to an alternate-key block is detected, delinking the alternate-key overflow block, adding new alternate-key location table entries to new alternate-key location table and rendering these as new alternate-key blocks.

8. A database reorganization system, comprising:

data records containing data items containing primary keys and alternate keys;

primary blocks storing data records in the order of their primary keys;

alternate-key entries comprising alternate keys and primary keys;

alternate-key blocks containing alternate-key entries;

current alternate-key location table containing alternate-key location table entries in contiguous regions; and

means for shifting fore and aft records in alternate-key blocks and eliminating fragmentation when the storage rate in alternate-key blocks falls outside a range of specified values.

9. The database reorganization system of claims 6 or 7, additionally comprising:

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provision of reorganization pointers to each of the current alternate-key location table and new alternate-key location table and storage in each reorganization pointer of the entry through which reorganization has terminated.

10. The database reorganization system of claims 6 or 7, additionally comprising:

comparative means for, when retrieving a record by alternate key during reorganization, comparing the value of the target alternate key with the value of the alternate key of the record contained in the alternate-key block of the entry indicated by the reorganization pointer; and

retrieval means for using the current alternate-key location table to retrieve the target record when the value of the target alternate key is found by the comparative means to be greater than or equal to the value of the alternate key of the record stored in the blocks indicated by the reorganization pointer and for using the new alternate-key location table to retrieve the target record when it is found to be less than the value of that alternate key.

11. A database system, comprising:

data records containing data items containing primary keys and alternate keys;

primary blocks storing data records in the order of their primary keys;

alternate-key entries comprising alternate keys and primary keys;

alternate-key blocks containing alternate-key entries;

current alternate-key location table containing alternate-key location table entries in contiguous regions; and

storage of alternate-key entries in alternate-key blocks in the order of their alternate keys and, when no further entries may be stored in an alternate-key block, linkage of a new alternate-key overflow block to that alternate-key block and storage in that alternate-key overflow block of alternate-key entries that cannot be stored in the alternate-key block.

12. A database system, comprising:

data records containing data items containing primary keys;

primary blocks storing data records in the order of their primary keys;

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Art 19*

a location table containing in a contiguous region entries describing the addresses of the primary blocks;

means for shifting fore and aft records in primary blocks and eliminating fragmentation when the storage rate in primary blocks falls outside a range of specified values;

contiguous regions joined for storage of the addresses of unused blocks resulting from the elimination of fragmentation; and

pointers indicating the start points and end points of those contiguous regions.

13. A database system, comprising:

data records containing data items containing primary keys;

primary blocks storing data records in the order of their primary keys;

a location table containing in a contiguous region entries describing the addresses of the primary blocks; and

maintenance within a primary block of the proportion of the space used within that primary block.

14. A database reorganization system, comprising:

data records containing data items containing primary keys;

primary blocks storing data records in the order of their primary keys;

overflow blocks linked to primary blocks;

a current location table containing in a contiguous region entries describing the addresses of the primary blocks;

a first means for creating, upon receipt of a database reorganization command, a new location table in addition to the current location table;

a second means for sequentially writing primary block entries in the current location table to the new location table and, when an overflow block is detected, delinking the overflow block, adding new entries to the new location table and rendering these as new primary blocks in the new location table; and

a third means for writing current database blocks as primary blocks in the new location table.

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Art 19*

15. A database reorganization system, comprising:

data records containing data items containing primary keys;

primary blocks storing data records in the order of their primary keys;  
and

a first means, in a backup database reorganization system having a current location table containing in a contiguous region entries describing the addresses of the primary blocks, for creating, upon receipt of a database reorganization command, a new location table in addition to the current location table; and

a second means, in that backup database reorganization system, for sequentially writing primary block entries in the current location table to the new location table and, when an overflow block linked to a primary block is detected, delinking the overflow block, adding new entries to the new location table and rendering these as new primary blocks.

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